

MAGATAYEV, K.S.; PATRUSHEVA, V.D.; KOMAROV, V.P.

Study of spherosiderites as weighting material of clay muds.  
Trudy Geol.inst.Dag.fil. AN SSSR 2:204-212 '60. (MIRA 15:12)  
(Samur Valley—Spherosiderite)  
(Oil well drilling fluids)

SOLNYSHKOV, A. I. ; KOMAROV, V. P. ; KUZNETSOV, V. S. ; ABROYAN, M. A. ; IVANOV, N. F.  
ZHELEZNIKOV, F. G. ; ROYFE, I. M. ; ZABLOTSKAYA, G. R. ; IVLEV, I. V. ; LATMANISOVA, G. M.  
and GERASIMOV, V. P.

Current Injector for a Strong Focussed Linac.

report presented at the Intl. Conf. on High Energy Accelerators, Dubna, August 1963.

KOMAROV  
~~KOMAROV~~, V. S.

Rubber Abstracts  
March 1954  
Vulcanised  
Natural Rubber

1173. Distribution of components of binary solution between high polymer and the solution phases. G. I. STAROBINETS and V. S. KOMAROV. Doklady Akad. Nauk S.S.S.R., 1952, 86, 751-4; Battelle Tech. Rev., 1953, 2, abs. 13083. Various vulcanised rubbers were used as the high polymer phase and normal alcohols in benzene as the homologous solution phase. Distribution in the entire region of composition variation of the binary mixtures at 20° C. was studied. 63485

KOMAKOV, V.S.

V.S.

1671. Equilibrium

...  
 40-5; Chem. Abstr. ...  
 ...  
 ... of alcohol ...  
 ... were determined ... pure benzene,  $Q_2$  was  
 0.16. Over pure alcohol,  $Q_1$  increase from methyl alcohol to  
 hexanol, and (at 60°) octadecanol. Over benzene containing  
 little alcohol  $Q_1$  was greater, and over alcohol containing little  
 benzene,  $Q_2$  was greater, the smaller the amount of the  
 alcohol. Over the intermediate ...  
 ... an alcohol in the ... of the  
 liquid ( $n_2$ ) in the ... the ... in the  
 vacuum between  $n_1$  ...  
 $n_1$ . At  $n_2$ , ...  
 through a ...  
 alcohol and propyl ...  
 hexanol, and octadecanol, ...

November 1951

Vulcanised

Natural Rubber

3/2, 29 p. 21

of octadecanol. In the solid state, the maximum and the minimum of the dielectric loss when the composition of the mixture is varied, is in agreement with that in the liquid. This was confirmed by measurement of the dielectric constant. Further taken up into molecules of alcohol. The  $Q_1 + Q_2$  is greater, the stronger the quasi-crystalline structure of the solution.

KOMAROV, V. S.

KOMAROV, V. S. -- "Experimental Investigation of the Thermodynamics of Swelling of High Polymers as a Function of the Structure of Binary Mixtures." Acad Sci Belorussian SSR, Department of Physicomathematical and Technical Sciences. Minsk, 1955. (Dissertation for the Degree of Candidate of Chemical Sciences.)

SO: Knizhnaya letopis', No. 4, Moscow, 1956

*KOMAROV, V.S.*

USSR/Surface Phenomena. Adsorption. Chromatography. Ion Interchange B-13

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26377

Author : G.L. Starobinets, V.S. Komarov

Title : Sorption of Binary Solutions by Vulcanized Natural and Synthetic Rubbers. II. Application of Laws of D.P. Konovalov and Rule of M.S. Vrevskiy to Equilibrium Polymer - Binary Solution.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 8, 1771-1775

Abstract : The analogy between the azeotropism in binary systems and the appearance of extremums on isotherms of general sorption (IGS) by high polymers (HP), for example, vulcanised rubbers, was noted. It is shown that the properties of IGS are described by the laws of D.P. Konovalov and the rule of M.S. Vrevskiy; the total amount of the substance sorbed by the HP rises with the concentration rise of the solution component, which is richer in HP-s; the composition of the solution in the phase of HP-s is equal to the composition of the equilibrium binary solution at points corresponding to the extremums of IGS; with a rise of the temperature, the maximum on IGS shifts to the side of the component, the heat of evaporation

Card : 1/2

*Belorussian State Univ.*

USSR/Surface Phenomena. Adsorption. Chromatography. Ion Interchange B-13

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000824110005-0"

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26377

of which is greater, and the minimum shifts to the opposite side. The isotherms of partial sorption of the non-solvent in binary systems solvent - non-solvent pass through a maximum, the appearance of which depends on the existence of a crystal composition of solvent - non-solvent mixtures. See part I in RZhKhim, 1957, 22548.

Card : 2/2

KOMAROV, V.S.

Study of the equilibrium curves of the components of a binary  
mixture of a polymer and solvent. Sbor. nauch. rab. Inst. khim.  
AN BSSR no.6:163-169 '58. (MIRA 11:11)  
(Phase rule and equilibrium) (Polymers)



KOMAROV, V.S.; YERPOLENEO, N.F.

~~XXXXXXXXXXXXXXXXXXXX~~  
Adsorption from a binary azeotropic mixture with negative  
deviation from Raoult's law. Dokl. AN BSSR 2 no.7:288-290  
Ag '58. (MIRA 11:10)

(Adsorption)

KOMAROV, V.S.

PHASE I BOOK EXPLOITATION

SOV/3779

Starobinets, Grigoriy Lazarevich, and Vladimir Stepanovich Komarov

Kauchukopodobnyye polimery - sorbenty i khromatograficheskiy materialy  
(Elastomers as Sorbents and Chromatographic Materials) Minsk, Izd-vo  
Belgosuniversiteta, 1959. 127 p. 1,500 copies printed.

Sponsoring Agencies: Minsk. Belorusskiy gosudarstvennyy universitet imeni  
V.I. Lenina; Akademiya nauk BSSR. Institut obshchey i neorganicheskoy khimii;  
BSSR. Ministerstvo vysshego, srednego spetsial'nogo i professional'nogo  
obrazovaniya.

Ed.: N.D. Ges'; Tech. Ed.: I.Ye. Belen'kaya.

PURPOSE: This book is intended for researchers studying the physicochemical  
properties of polymers, and for persons interested in the theory and practical  
application of sorption and chromatographic processes.

Card 1/4

Elastomers as Sorbents and Chromatographic Materials

SOV/3779

COVERAGE: The book presents reviews and theoretical conclusions on data from  
Soviet and foreign sources on the application of elastomers as selective  
sorbents in the separation of binary and multicomponent systems by extraction  
or some variation of the molecular chromatographic method. Experimental data  
compiled by G.L. Starobinets in studying the sorption of vapor systems at the  
Belorussian University imeni V.I. Lenin, and data on the sorption of liquid  
systems, compiled by V.S. Komarov at the Chemistry Institute of the Academy of  
Sciences BSSR, are also included. Calculations of partial thermodynamic  
functions of sorbent components from equilibrium conditions between the  
polymer and the binary solution phases are given. Data on the use of elastomers  
in chromatography (Chapter IV) were compiled by Starobinets with the assistance  
of V.F. Tikav, E.V. Povarkov, L.I. Sebast'yanova and G.N. Bulatska of the  
Department of Analytical Chemistry of the Belorussian University. Theoretical  
conclusions from data on thermodynamic interpretations of sorption phenomena,  
techniques of setting up and plotting polymer--binary solution system diagrams,  
and other aspects of the study are drawn by G.L. Starobinets. Kh. M.  
Aleksandrovskiy participated in the initial stages of the work. The authors  
thank A.A. Zhukhovitskiy and S.M. Lipatov. There are 207 references: 121 Soviet,  
68 English, 3 French, 1 Finnish, and 14 German.

Card 2/4

Elastomers as Sorbents and Chromatographic Materials

SOV/3779

5. Influence of the ingredients of a rubber on the equilibrium between a polymer and a binary solution	65
6. Isotherm of effective sorption from binary solutions and from binary mixtures of saturated vapors	68
Ch. III. Some Problems in Sorption Thermodynamics	
1. Partial molar thermodynamic functions of sorbent components	72
2. Specific partial thermodynamic functions of a high polymer	77
3. Modeling of systems: polymer — binary mixture of low-molecular components	84
Ch. IV. Some Applications of Elastomers in Chromatography	
1. Sorption properties of rubber-like copolymers	105
2. The use of elastomers in partition chromatography	111
3. Cationites from sulfonated elastomers	117
Bibliography	123

AVAILABLE: Library of Congress

Card 4/4

JA/cdw/mas  
7-21-60

Determination of the structure of certain White Russian clays from the sorption of carbon tetrachloride vapors. Sbor. nauch. rab. Inst. fiz.-org. khim. AN BSSR no. 7:57-67 '59. (MIRA 14:4)  
(Carbon tetrachloride) (White Russia—Clay)

5(4)

SOV/69-21-3-9/25

AUTHOR: Komarov, V.S.

TITLE: Pressure Dependence of Swelling Isotherms and Equilibrium Curves

PERIODICAL: Kolloidnyy zhurnal, 1959, Vol XXI, Nr 3, pp 298-300 (USSR)

ABSTRACT: The author reports on a study of shift of equilibrium in binary solutions during the swelling of a polymer, the affinity of the solution components to the polymer and their correlation during the swelling phases. The polymer used for the experiments was natural rubber vulcanizate NK. The solutions were the systems: Benzene-ethyl alcohol and benzene-chloroform. The swelling of the polymer was studied in a metallic device designed for the purpose. The pressures used to swell the polymer were atmospheric pressure and atmospheric excess pressure. The experiment has shown that in the region of maximum polymer swelling, the position of the isotherms distinctly depends on external pressure.

Card 1/2

Pressure Dependence of Swelling Isotherms and Equilibrium Curves

SOV/69-21-3-9/25

This is due - in accordance with the principle of Le Chatellier - to a surface diminution of the swelling polymer by a magnitude, which corresponds to the change of free energy. The shift of equilibrium under external action is connected not only with decrease of the solution in the amount of liquid absorbed by a gram of the swelling polymer, but is also accompanied by a change in the composition of the solution. As to the latter, the change will be the greater, the greater is the difference in the free energy of formation of a mole of real solution and a mole of ideal solution. There are 1 diagram, 1 set of graphs and 1 Soviet reference.

ASSOCIATION: Institut khimii AN Belorusskoy SSR, Minsk (Institute of Chemistry of the AS Belorusskaya SSR, Minsk)

SUBMITTED: 18 January, 1958

Card 2/2

KOMAROV, V.S.; YERMOLENKO, H.F.; VARLAMOV, V.I.

Swelling of White Russian clays. Dokl.AN BSSR 4 no.3:108-112 M<sub>r</sub>  
'60. (MIRA 13:6)  
(White Russia--Clay)

KOMAROV, V.S.; LEVINA, S.A.; KUREYCHIK, L.A.

Effect of the nature of the medium on the catalytic conversion  
of acetone into diacetone alcohol. Dokl. AN BSSR 4 no. 5:206-209  
My '60. (MIRA 13:10)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.  
Predstavleno akademikom AN BSSR N.F. Yermolenko.  
(Acetone) (Propanone)

KOMAROV, V.S.; YERMOLENKO, N.F., akademik

Adsorption selectivity as a function of the sorbent structure.  
Dokl. AN SSSR 135 no.1:129-132 N'60. (MIRA 13:11)

1. AN BSSR (for Yermolenko). 2. Institut obshchey i neorganicheskoy  
khimii AN SSSR.  
(Adsorption) (Sorbents)



YEROFEYEV, B.V. [Erafeeu, B.V.]; KOMAROV, V.S. [Kamarou, V.S.]

Sergei Mikhailovich Lipatov; obituary. Vestsi AN BSSR Ser. fiz.-tekh.  
nav. no. 1:138-140 '61. (MIRA 14:4)

(Lipatov, Sergei Mikhailovich, 1899-1961)

S/081/61/000/021/019/094  
B102/B138

**AUTHORS:** Komarov, V. S., Yermolenko, N. F., Varlamov, V. I.

**TITLE:** Structure and adsorption activity of organic clays

**PERIODICAL:** Referativnyy zhurnal. Khimiya, no. 21, 1961, 68, abstract 21B553 (Dokl. AN BSSR, v. 5, no. 3, 1961, 105-108)

**TEXT:** Investigation is made, of the sorptive, structural, and other characteristics of a series of aminated organic clays (AOC), prepared on the basis of Georgian askanite gel and Belorussian clays. The  $\text{CCl}_4$  sorption capacity and the specific surface of AOC's were greater than those of natural clays. Substitution of inorganic by organic cations will, obviously, be accompanied by the loosening of the crystalline structure of the clay and by an increase in the sorption potential. There is no essential difference between the shape of the  $\text{CCl}_4$  sorption isotherms of AOC and those of natural clays. All the sorbents examined belong to the fourth structural type of Kiselev's classification. Water sorption is 50-75% that of benzene, due, apparently to the hydrophobic action of the carbon chain of amine. The degree of swelling of AOC in

Card 1/2

S/081/62/000/007/015/033  
B156/B101

AUTHOR: Komarov, V. S.

TITLE: New method of determining the apparent specific gravities of powdered substances

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 7, 1962, 345, abstract 7I129 (Dokl. AN BSSR, v. 5, no. 8, 1961, 336-338)

TEXT: A new method is proposed for determining the apparent specific gravities of powdered adsorbents, catalysts, and soils; the method allows the true porosity to be found, which can be used in practice in catalysis and adsorption processes. It is pointed out that, to determine apparent specific gravities, the true specific gravity  $d$  of the powder, and the maximum volume  $v$  of liquid adsorbed by it, must be found. An equation is given for calculating the effective porosity:  $P = (d - d/V)d^{-1} \cdot 100\%$ ; here,  $V = v + 1$  (in  $\text{cm}^3$ ). The method has been verified on bentonite powder, coal dust, and metal-silicate catalyst

Card 1/2

New method of determining the ...

S/081/62/000/007/015/033  
B156/B101

powders. The results are shown to agree well with those obtained by the mercury displacement method. [Abstracter's note: Complete translation.]

Card 2/2

KOMAROV, V.S.; YERMOLENKO, N.F.

Dependence of adsorption selectivity on the nature of binary mixtures. Zhur. fiz. khim. 35 no.1:9-14 Ja '61. (MIRA 14:2)

1. Akademiya nauk BSSR, Institut khimii.  
(Adsorption)

KOMAROV, V.S.; YERMOLENKO, N.F., akademik; VARLAMOV, V.I.

Production of a highly active mechanically strong clay hydroxide adsorbent by means of acid activation of clays. Dokl. AN SSSR 139 no.3:665-668 J1 '61. (MIRA 14:7)

1. Institut obshchey i neorganicheskoy khimii AN BSSR. 2. AN BSSR (for Yermolenko).

(Clay) (Adsorbents)

38112

S/020/62/144/002/025/028  
B101/B110

11.0120

AUTHORS: Komarov, V. S., Yermolenko, N. F., Academician AS BSSR, and Varlamov, V. I.

TITLE: Thermocatalytic desulfurization of hydrocarbon fuels on a calcined clay-hydroxide catalyst

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no.2, 1962, 406 - 408

TEXT: In view of the planned raise of petroleum production in the Ural-Volga area an inexpensive industrial desulfurization process was developed. Experiments were made with an iron-containing clay-hydroxide catalyst which had been described already earlier. (DAN, 139, no. 3, 665 (1961)). Desulfurization was carried out in a heated glass tube, the air being displaced by  $N_2$ . The catalyst was regenerated by blowing air through the tube at 550 - 600°C. Results: (1) 95.7 and 80.3 % S could be removed from gasoline (b.p. 40 - 200°C) containing 0.070 % S at fuel-to-catalyst ratios of 2:1 and 20:1, respectively. At ratios of 2:1 and 10:1, 92.4 and 85 - 87 % S, respectively, could be removed from ligroin (b.p. 120 - 240°C) containing 0.146 % S. (2) The catalyst could be regenerated repeatedly. After 20.  
Card 1/2

S/020/62/144/002/025/028  
B101/B110

Thermocatalytic desulfurization of ...

cycles its activity was only 7 - 10 % less. This is probably due to the deposition of Fe, Mn, Al, Mg, Cr, Si, etc. which are present in the fuels as organic complexes. (3) Losses in the form of coke, gas, and polymers amount to 3 - 5 %. (4) Consumption of catalyst per unit weight of fuel is ~0.27 % for gasoline, and ~0.40 % for ligroin. (5) The sulfur of the organic compounds is completely adsorbed by the catalyst and separated as  $SO_2$  and elementary sulfur during regeneration. No corroding  $H_2S$  is formed. (6) Additional cleaning of the distillate with alkali is unnecessary. The catalyst is recommended for use in refineries. There are 1 figure and 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii Akademii nauk BSSR (Institute of General and Inorganic Chemistry of the Academy of Sciences BSSR)

SUBMITTED: January 26, 1962

Card 2/2

KOMAROV, V.S., inzh.; ZYBIN, A.G., inzh.

Control and protection of double fans in local ventilation.  
Izv. vys. ucheb. zav.; gor. zhur. no.8:162-167 '61. (MIRA 15:5)

1. Vostochnyy nauchno-issledovatel'skiy institut po  
bezopasnosti rabot v gornoy promyshlennosti. Rekomendovana  
Vostochnym nauchno-issledovatel'skim institutom po bezopasnosti  
rabot v gornoy promyshlennosti.

(Fans, Electric)



<sup>①</sup>  
KAMAROV, V.S.; YERMOLENKO, N.F.

Highly active adsorbent for the regeneration of oils used in power engineering. Dokl. AN BSSR 6 no.4:229-232 Ap '62. (MIRA 15:4)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.  
(Insulating oils) (Clay)

KOMAROV, V.S.; YERMOLENKO, N.F., akademik; VARLAMOV, V.I.

Thermocatalytic desulfurization of hydrocarbon fuel on a  
calcined clay-hydroxide catalyst. Dokl. AN SSSR 144 no. 2:406-  
408 My '62. (MIRA 15:5)

1. Institut obshchey i neorganicheskoy khimii AN Belorusskoy SSR.
2. AN Belorusskoy SSR (for Yermolenko).  
(Petroleum as fuel) (Desulfuration) (Catalysts)

KOMAROV, V. S.; YERMOLENKO, N. F.

Adsorption-structural and physicochemical properties of clay  
hydroxide adsorbents. Koll. zhur. 24 no.6:709-716 N-D '62.  
(MIRA 16:1)

1. Institut obshchey i neorganicheskoy khimii AN BSSR, Minsk.

(Clay) (Adsorption)

KOMAROV, V. S.; YERMOLENKO, N. F., akademik; VARLAMOV, V. I.;  
VOLNETKO, I. N.

Highly active ferocaluminsilicate contact catalyst for  
thermal desulfuration of petroleum products. Dokl. AN SSSR  
147 no.6:1413-1416 D '62. (MIRA 16:1)

1. Institut obshchey i neorganicheskoy khimii AN Belorusskoy  
SSR. 2. AN Belorusskoy SSR (for Yermolenko).

(Petroleum products) (Desulfuration)  
(Catalysts)

KOMAROV, V.S., inzh.; NAZLUKHANYAN, V.M., inzh.; BELIKOVA, T.V., inzh.

VIRS-2 nonsparking relay with induction pickups. Bezop.truda v prom.  
6 no.8:30 Ag '62. (MIRA 16:4)

(Electric relays)

KOMAROV, V.S.; YERMOLENKO, N.F.

Bleaching and regenerating properties of clay-hydroxide  
adsorbents. Zhur. prikl. khim. 36 no.5:941-949 My '63.  
(MIRA 16:8)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.  
(Adsorbents) (Clay)

ACCESSION NR: AP4039330

S/0250/64/008/004/0241/0245

AUTHOR: Komarov, V. S.; Yermolenko, N. F.; Varlamov, V. I.

TITLE: Thermocatalytic desulfurization of special kerosene and diesel fuel over iron aluminosilicate catalyst

SOURCE: AN BSSR. Doklady\*, v. 8, no. 4, 1964, 241-245

TOPIC TAGS: iron aluminosilicate, catalyst, thermocatalytic desulfurization, special kerosene, kerosene, diesel fuel

ABSTRACT: The activity of iron aluminosilicate catalysts in the thermocatalytic desulfurization of high-boiling petroleum distillates — special kerosene (S content, 0.125%) and diesel fuel — has been tested and the optimum desulfurization conditions and the catalyst life have been determined. The experiments were conducted in flow equipment by a standard procedure described earlier. In the case of special kerosene desulfurization, 450C was the optimum temperature. The gaseous products were 92.2—94.4% H<sub>2</sub> and

Card

1/3

ACCESSION NR: AP4039330

contained no  $H_2S$ , which is retained by the catalyst as iron sulfites. Because of the absence of  $H_2S$ , equipment corrosion is not a danger and chemical refining of the products is unnecessary; capital investment and production costs are, therefore, low. The loss of catalyst after 40 regenerations was only 0.28% and the degree of desulfurization averaged 88.1%, corresponding to a concentration of sulfur in the refined kerosene of 0.014%. It was concluded that this process is at present one of the cheapest and the most rational desulfurization processes for petroleum products which boil below 300C. However, the degree of desulfurization in diesel fuel at 450C depended to a great extent on the feed space velocity and on the feed/catalyst ratio. The highest degree of desulfurization (75.1%) was obtained at a space velocity of 0.3 hr and a feed/catalyst ratio of 1:1. The difficulty in desulfurizing diesel fuel apparently lies in the rapid contamination of the catalyst surface with coke. It was concluded, therefore, that desulfurization of high-boiling distillates requires a catalyst which would 1) stimulate sulfur-compound decomposition, 2) chemically bind sulfur and remove it from the reaction zone, and 3) have a low

Card 2/3

APPROVED FOR RELEASE: 06/13/2000  
ACCESSION NR: AP4039330

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coking capacity. This research was done at the Institute of General and Inorganic Chemistry, Academy of Sciences, BSSR. Orig. art. has: 1 figure and 4 tables.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN BSSR  
(Institute of General and Inorganic Chemistry, AN BSSR)

SUBMITTED: 17Jan64

DATE ACQ: 09Jun64

ENCL: 00

SUB CODE: FP, GC

NO REF SOV: 009

OTHER: 000

Card 3/3



KOMAROV, V.S.; KAYMAKOV, A.A.

New design of explosionproof couplings in electric equipment  
enclosures. Bezop. truda v prom. 8 no.11:51-52 N '64.

(MIRA 18:2)

1. Vostochnyy nauchno-issledovatel'skiy institut po bezopasnosti  
rabot v gornoy promyshlennosti.

1. 23287-65 EWT(m)/EWP(e)/EPF(c)/EWP(j) Pr-4/Pc-4 RM/VH  
 NR: AP4049491 S/0020/64/159/002/0423/0426

Yermolenko, N.F., (Acad. AN BSSR) Varlamov, V.I., Falina, A.S.

Preparation of cracking catalysts from kaolin

SOURCE: AN SSSR. Doklady\*, v. 159, no. 2, 1964, 422-426

TOPIC TAGS: cracking catalyst, kaolin catalyst, catalytic cracking, aluminosilicate catalyst, gas oil cracking

ABSTRACT: In order to improve the aluminosilicate catalysts made from clay, the following alkaline-acid method was tested. Kaolin, washed free of coarse mineral, was mixed with sufficient 20% NaOH to dissolve the  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$ . In excess, the mixture was heated on a boiling water bath for 8-12 hours, cooled to 15-20°C, and HCl was added with intensive stirring to dissolve the mineral. Then an aqueous solution of  $\text{NH}_3$  was added to raise pH to 6-6.5 and the settled precipitate was thoroughly washed until free of chloride ions. After drying at room temperature and then for 3-4 hours at 150-200°C, the catalyst was activated with a 0.1 N solution of an aluminum salt or 0.01 N of HCl. It was then washed with water, dried, and subjected to heat treatment at 550°C in a slow stream of dry air for 6-8 hours. The catalyst was used for cracking gas oil

Card 1/2

L 23287-65

ACCESSION NR: AP4049491

fractions. The results show that the catalytic properties were comparable to  
of synthetic aluminosilicate catalysts and that the stability was greater.  
as: 3 tables and 1 figure.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii Akademii nauk BSSR  
(Institute of General and Inorganic Chemistry of the Academy of Sciences, BSSR)

SUBMITTED: 11Jun64

ENCL: 00

SUB CODE: FP, IC

NO REF SOV: 012

OTHER: 005

Card 2/2



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... LOST IN AR AT5001796

[illegible]

SUBMITTED: 00

ENCL: 00

SUB CODE: ES

NO REF SOV: 008

OTHER: GOR

KOMAROV, V.S.

Classification of explosive mixtures according to their ignitability by electric sparks. Vop.bezop.v ugol'.shakh. 4:227-232 '64.

Ignitability of gas mixtures by weak electric sparks. Ibid.: 251-257 (MIRA 18:1)

KOMAROV, V.S.; YERMOLENKO, N.F., akademik; VARLAMOV, V.I.; FALINA, A.S.

Method of preparing kaolin-base catalysts for the cracking process.  
Dokl. AN SSSR 159 no.2:423-426 N '64. (MIRA 17:12)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.
2. AN BSSR (for Yermolenko).

KOMAROV, V.S.; POVOROZNYUK, L.I.; PLYUSHCHEVSKIY, N.I.; ZONOV, Yu.G.

Effect of acid treatment on the structure of clay minerals. Dokl.  
AN BSSR 9 no.7:450-453 J1 '65. (MIRA 18:9)

1. Institut obshchey i neorganicheskoy khimii AN Belorusskoy SSR.



L 00859-66 ENT(1)/FCC GW

ACCESSION NR: AT5013143

UR/2667/65/000/031/0045/0058

AUTHOR: Komarov, V. S.

TITLE: Average. field of thermal wind over the Northern Hemisphere in January

SOURCE: Moscow. Nauchno-issledovatel'skiy Institut aeroklimatologii. Trudy no. 31, 1965. Voprosy aeroklimatologii severnogo polushariya (Problems in the aeroclimatology of the Northern Hemisphere), 45-58

TOPIC TAGS: thermal wind, geostrophic wind

ABSTRACT: The article analyzes certain features of the average field of thermal wind in the free atmosphere up to an isobaric surface altitude of 50 mb on the basis of maps of the average thermal wind between the principal isobaric surfaces. The character of the change in the field of the thermal wind with the altitude is examined. Consideration is given to the contributions of the thermal wind of various atmospheric layers to the change in the zonal component of the geostrophic wind in the troposphere and lower stratosphere for various regions of the Northern Hemisphere. Also analyzed is the problem of deviations of the zonal velocity component of the actual wind from the zonal component of the geostrophic wind in the region of the subtropical planetary frontal zone over the Eurasian continent. Orig. art. has: 3 figures, 6 tables, and 9 formulas.

Card 1/2

L 00859-66

ACCESSION NR: AT5013143

ASSOCIATION: Nauchno-issledovatel'skiy institut aeroklimatologii, Moscow (Scientific  
Research Institute of Aeroclimatology)

SUBMITTED: 00

ENCL: 00

SUB CODE: ES

NO REF SOV: 008

OTHER: 006

Card 2/2

L 00850-66 ENT(1)/FCC GW

ACCESSION NR: AT5013145

UR/2667/65/000/031/0097/0109

AUTHOR: Komarov, V. S.

55,44

TITLE: Vertical structure of the subtropical planetary frontal zone over Eurasia during the winter period

SOURCE: Moscow. Nauchno-issledovatel'skiy institut aeroklimatologii. Trudy, no. 31, 1965. Voprosy aeroklimatologii severnogo polushariya (Problems in the aeroclimatology of the Northern Hemisphere), 97-109

TOPIC TAGS: subtropic planetary frontal zone, meridian temperature gradient, vertical atmosphere structure, jet stream

55,44,12

ABSTRACT: The article examines the characteristics of the vertical distribution of average horizontal meridional temperature gradients, and the zonal and vertical components of wind velocities along the axis of the subtropical planetary frontal zone over Eurasia in January. Certain features of the vertical structure of the atmosphere (up to 16 - 20 km altitude) are revealed. The study was made by using complex meridional cross sections intersecting the planetary frontal zone at various meridians (20° WL, 20, 60, 120, 140° EL, and 180°). The relative positions of the axes of the zones of large horizontal gradients at isobaric surfaces of 500 and 300 mb and of the axis of the jet stream at an altitude of 200 mb are

Card 1/2

L 00858-66

ACCESSION NR: AT5013145

3  
analyzed. The position of the axis of the jet stream in the zone of the subtropical planetary frontal zone relative to the level of the zero horizontal meridional temperature gradient is demonstrated. Orig. art. has: 6 figures, 2 tables, and 7 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy institut aeroklimatologii, Moscow  
(Scientific Research Institute of Aeroclimatology)

SUBMITTED: 00

ENCL: 00 55, 44, 12

SUB CODE: ES

NO REF SOV: 013

OTHER: 012

Card

2/2

L 22081-66 EWT(m)/EWA(d)/T JW

ACC NR: AP6012661

SOURCE CODE: UR/0069/65/027/003/0388/0395

AUTHOR: Komarov, V. S.; Yermolenko, N. F.—Ermolenko, N. F.; Volneyko, I. N.—  
Volneiko, I. N. 46  
44  
3

ORG: Institute of General and Inorganic Chemistry, AN BSSR, Minsk (Institut obshchey i neorganicheskoy khimii AN BSSR)

TITLE: Drying of air by clay adsorbents 7.44

SOURCE: Kolloidnyy zhurnal, v. 27, no. 3, 1965, 388-395

TOPIC TAGS: adsorption, surface tension, vapor pressure, temperature dependence, sorption, aluminum silicate

ABSTRACT: The results of the studies show that the best adsorption properties are exhibited by clay-hydroxide and iron aluminosilicate adsorbents activated at 120 - 200°. There is no great difference between the dynamic activities of samples activated at 120 and 200°. If the activation temperature is increased from 200 to 600°, the activity decreases somewhat. The decrease in dynamic activity of baked clay-hydroxide adsorbents is due principally to change in structure which is accompanied by an increase in the mean pore radius from 25 to 45 Å. For porous adsorbents, where adsorption and condensation occur simultaneously, the sorption potential is determined, on the one hand, by the specific surface, and, on the other, by the radius and volume of the pores. As the pore radius increases at constant specific surface, the adsorption potential decreases. The adsorption capacity and the protection time of the

Card 1/4

UDC: 541.183: 542.47

L 22081-66

ACC NR: AP6012661

adsorbents depend greatly on the humidity of the air being dried, and, to a considerable extent, on the structure of the sorbent and the distribution of the pore volumes in radii. The adsorption capacity and the protective time vary oppositely with increase in humidity, but this is only strictly true of adsorbents having a mixed pore structure. For such adsorbents, each successive increase in volume of sorbed moisture, corresponding to a definite value of  $\Delta r$ , is always less than the preceding volume for the same value of  $\Delta r$ , i.e., for each new increase in humidity, in spite of the fact that the total absorption is increasing, the increase in sorption volume decreases. On the other hand, for adsorbents with pores of uniform size, the increase in the sorption volume first increases with increase in air humidity, and reaches a maximum value at a humidity which produces filling of the pores, the dimensions of which correspond to the maximum on the distribution curve. Here, the increase in sorption volume ( $\Delta V$ ), may, for a small increase in humidity of the gas, exceed the preceding value of  $\Delta V$  by several fold, so that the protection time of the adsorbent is increased. Practical use of adsorbents with pores of one size for complete drying is most satisfactory at a humidity of the gas such that during a dynamic experiment, capillary condensation embraces the pores lying in the region of the maximum of the distribution of volumes in radii. The protective action and the dynamic activity decrease appreciably as the temperature is increased. The effect of temperature is equivalent, on the

Card 2/4

L 22081-66

ACC NR: AP6012661

2

one hand, to reducing the relative vapor pressure, or eliminating the larger pores, and, on the other hand, increasing the temperature increases the thermal motion of the molecules, which prevents orientation of the molecules, and keeps them from being held back in the force field of the adsorbent. Increasing the temperature also decreases the surface tension which straightens out the meniscus, increases the vapor pressure over the liquid surface in the capillary, and decreases the force of attraction of the molecules of vapor to the liquid surface having smaller curvature of the meniscus. All this evidently affects the rate of sorption of moisture, and particularly the capillary condensation rate.

The moisture capacity of the adsorbent is greater for small sized granules and decreases as they become larger, due to diffusion hinderances of the molecules of moisture inside the adsorbent grains. The grain size of the adsorbent, while affecting the kinetics of the sorption process, has no effect on the degree of drying of the gas. The degree of drying of the gas appears to be a specific property of the adsorbent, and depends principally on the magnitude and chemical nature of the specific surface, the physical structure, the pore size, and the height of the adsorbent layer, as well as on the affinity of the adsorbate molecules for the surface, and the velocity of the gas stream. The adsorbent was regenerated for 1.5 hours at a temperature of 200°, after which it

Card 3/4

L 22081-66

ACC NR: AP6012661

was again tested. The data show that the sorption activity of an iron aluminosilicate adsorbent remains practically unchanged even after the eighth regeneration. Nor is there any mechanical destruction of the adsorbent grains. Orig. art. has: 7 figures and 4 tables. [JPRS]

SUB CODE: 07, 20 / SUBM DATE: 26Dec63 / ORIG REF: 017 / OTH REF: 003

Card 4/4 BLG



KOMAROV, V.S., inzh.

Improved instruments for testing explosion-proof shells. Bezop.  
truda v prom. 4 no.12:28 D '60. (MIRA 14:1)  
(Electric instruments)

TKACH, Aleksandr Grigor'yevich; KOPYLOV, V.I., inzh., retsenzent;  
KOMAROV, V.S., inzh., spets. red.; FUKS, V.K., red.;  
SOKOLOVA, I.A., tekhn. red.

[Concise manual for the tobacco worker] Kratkii spravochnik  
tabachnika. Moskva, Pishchepromizdat, 1963. 112 p.  
(MIRA 16:6)

(Tobacco industry)

VLASOV, Petr Fedorovich; KOMAROV, V.S., inzh., retsenzent;  
YERMOKHINA, N.V., red.; KISINA, Ye.I., tekhn. red.

[Ventilation, air-conditioning and pneumatic conveying in  
tobacco factories] Ventiliatsiia, konditsionirovanie voz-  
dukha i pnevmaticheskii transport na tabachnykh fabrikakh.  
Moskva, Pishchepromizdat, 1963. 155 p. (MIRA 16:12)  
(Pneumatic conveying) (Tobacco industry)

KOMAROV, V.S., inzh.

All-Union congress on supplying coal shafts with electric power.  
Ugol' 39 no.1:75 Ja '64. (MIRA 17:3)

1. Vostochnyy nauchno-issledovatel'skiy institut po bezopasnoti  
rabot v gornoy promyshlennosti.

KOMAROV, V.V.

56-6-2/47

AUTHORS: Vasil'yev, S. S., Komarov, V. V.,  
Popova, A. M.

TITLE: Problem of Fast Neutron Induced Disintegration of the  
C12 Nucleus Into Three  $\alpha$ -Particles. (K voprosu  
o raspade yadra C12 na tri  $\alpha$ -chastitsy pod deystviyem  
bystrykh neytronov).

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1957,  
Vol. 33, Nr 6(12), pp. 1321-1324 (USSR)

ABSTRACT: The present paper investigates the course of the cross  
section of the decay of C12 into three  $\alpha$ -particles, beginning  
from the threshold ( $Q = -7.28$  MeV) up to 19 MeV. Further,  
the authors tried to explain the dependence of the decay  
mechanisms on the energy of the inciding neutrons. The decay  
stars were observed on photoplates  $\text{HMK} \Phi \text{N}$  Ya-2 and also  
in specially prepared layer-like emulsions with spectrally  
pure carbon (size of grain  $\sim 1 \mu$ ) as filling material.  
These plates were irradiated with neutrons from a thick  
lithium target. This lithium target was irradiated with  
deuterons, which were accelerated up to 4 MeV by means of a  
cyclotron. More than 500 stars of the decay of the C12 into  
3  $\alpha$ -particles were investigated. The wide spectrum of the lithium

Card 1/3

56-6-2/47

Problem of Fast Neutron Induced Disintegration of the  
C12 Nucleus Into Three  $\alpha$ -Particles

neutrons made it possible to determine the course of the  
cross section near threshold and a precise description  
of the position of the maximum in the course of the  
effective decay cross section. The dependence of the cross  
section on the energy of the inciding neutrons can be  
explained by the diversity of the decay mechanism at  
different neutron energies. The decay of C12 into three  
 $\alpha$ -particles occurs essentially by means of two principal  
reactions ( $N, n'$ ) and ( $n, \alpha$ ). In these two reactions different  
intermediary nuclei with different states of energy may  
form. The possible forms of these reactions are given here.  
In order to explain the mechanism of reaction in the case  
of different energies of the primary neutrons the  
excitation energies of the intermediate nuclei C12, Be9, Be8,  
were computed from the observed stars. For the various  
intervals of the energies of the inciding neutrons the  
more or less known levels of these nuclei were determined.  
This points in the direction of a certain probability of the  
decay with the creation of intermediary nuclei. With  
increasing energy of primary neutrons the probability of  
direct spallations increase, which is confirmed by

Card 2/3

KOMAROV, V. V.

56-2-30/47

AUTHOR

VASILYEV, S.S., KOMAROV, V.V., POPOVA, A.M.

TITLE

The Effective Cross Section of the Reaction  $\text{Be}^9(n, 2n)$   
(Effektivnoye srechniye reaktsii  $(n, 2n)$  na  $\text{Be}^9$ )

PERIODICAL

Zhurnal Eksperim. i Teoret. Fiziki 1957, vol 33, Nr 2 (8), pp 527 -  
- 528 (U.S.S.R.)

ABSTRACT

For neutron energies of from 1,5 to 19 MeV the cross section of the  
reaction  $\text{Be}^9(n, 2n)\text{Be}^8$  and the competing reactions  $\text{Be}^9(n, \alpha)\text{Li}^7$   
and  $\text{Be}^9(n, t)\text{Li}^7$  were determined.

1.)  $\text{Be}^9(n, - 2n)\text{Be}^8$

En		$\sigma$	
3	MeV	~0,03	b
4	MeV	~0,1	b
5	MeV	~0,13	b
6	MeV	~0,15	b
7,5	MeV	~0,6	b
9	MeV	~1,1	b
10,5	MeV	~1,3	b
13	MeV	~0,75	b
16	MeV	~0,8	b

Card 1/2

KOMAROV V.V.

VANIL'YEV, S.S.; KOMAROV, V.V.; POPOVA, A.M.

Effective cross section of the  $\text{Be}^9(n, \alpha)\text{He}^6$  reaction. Atom. energ.  
suppl. no.5:92-93 '57. (MIRA 11:2)  
(Nuclear reactions) (Beryllium--Isotopes)

21(7), 21(8)  
AUTHORS:

Komarov, V. V., Popova, A. M.

SOV/56-36-5-48/76

TITLE:

Direct Interaction in Reactions With the Departure of Two Nucleons (Pryamoye vzaimodeystviye v reaktsiyakh s vyletom dvukh nuklonov)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 5, pp 1574-1576 (USSR)

ABSTRACT:

In the present paper the authors investigate the angular distribution for the momentum direction in the center of mass system of two nucleons, which were formed by the direct interaction between an incident nucleon and one of the nuclear nucleons in reactions of the kind  $(n,2n)$ ,  $(p,2p)$ ,  $(n,n'p)$ ,  $(p,p'n)$ . The authors base on the assumption that the wave function of the incident nucleon ( $n_0$ ) may be set up for a plane wave and that that of the nuclear nucleon ( $n_1$ ), with which the former enters into interaction, corresponds to the shell model in the case of IS-coupling. The interaction of the two nucleons  $V_{n_0 n_1}$  is obtained in form of a square well (radius  $\rho_0$ ). For the wave function of the two

Card 1/4



Direct Interaction in Reactions With the Departure of Two Nucleons SOV/56-36-5-48/76

nucleons the following is obtained by taking their interaction into account:  $\psi_{2n}^{(1)} = \exp(i\vec{k}\vec{\rho}) + a\rho^{-1}\exp(-i\vec{k}\vec{\rho})$ .  $\vec{k}$  is the wave vector of the relative motion of the two nucleons,  $a = -(\alpha - i\epsilon)$  the scattering length,  $(\alpha = (M\epsilon\hbar^{-2})^{1/2})$ ,  $\epsilon$  is the interaction energy of the nucleons. In the internal domain ( $\rho < \rho_0$ ) the real part of the wave function of the system has the form  $\psi_{2n}^{(2)} = A\rho^{-1} \sin k'\rho$ ,  $k'$  is the wave vector of the relative motion within the potential well,  $A$  and  $k'$  are determined by the joining of  $\psi_{2n}^{(1)}$  and  $\psi_{2n}^{(2)}$  at the point  $\rho = \rho_0$ . For the differential cross section it holds that

$$\frac{d\sigma}{d\Omega} = \frac{M_0 M_{2n}}{(2\pi\hbar^2)^2} \frac{k_{2n}}{k_{n_0}} \frac{1}{(2s_0+1)(2J_1+1)} |\vec{f}|^2; M_0 \text{ and } M_{2n} \text{ are the reduced}$$

masses of the incident nucleons and of the system of the two interacting nucleons,  $k_{n_0}$  the momentum of the incident nucleon

Card 2/4

Direct Interaction in Reactions With the Departure of Two Nucleons

and  $k_{2n}$  the momentum of the center of mass of the system of interacting nucleons,  $s_0$  - the spin of the incident nucleon, and  $J_1$  - the total momentum of the primary nucleus; for the matrix element I it holds that  $I = \sqrt{n} \langle 1^n, \alpha_1 L_1 S_1 J_1 T_1; \vec{k}_{n_0} s_0 | V_{n_0 n_1} | 1^{n-1}, \alpha_2 L_2 S_2 J_2 T_2; \vec{k}_{2n} s_{2n} \rangle$ . The index 1 refers to the primary- and the index 2 to the final state of the nucleus; T is the isotopic spin. The authors numerically computed the angular distribution of the vector  $\vec{k}_{2n}$  for the reaction  $\text{Be}^9(n, 2n)\text{Be}^8$ , with the following being assumed:  $E_{n_0} = 14$  Mev, the excitation energy for the  $\text{Be}^8$ -nucleus = 2.9 Mev,  $\epsilon = 70$  kev. Integration was carried out in the range of kinetic energies from 0.5 to 2 Mev. Figure 1 shows the curves of the angular distribution of  $\vec{k}_{2n}$  both if  $\rho = 1.0 \cdot 10^{-13}$  cm and if  $\rho = 2.8 \cdot 10^{-13}$  cm. Figure 2 for the purpose of comparison shows the experimental histogram of this angular distribution (from reference 7), which was obtained by means of a photoemulsion.

Card 3/4

Direct Interaction in Reactions With the Departure of Two SOV/56-36-5-48/76  
Nucleons

The authors thank S. S. Vasil'yev for discussions and V. G. Neudachin for his valuable advice and comments. There are 2 figures and 7 references, 3 of which are Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta  
(Institute of Nuclear Physics of Moscow State University)

SUBMITTED: December 12, 1958

Card 4/4

SOV/120-59-1-10/50

AUTHORS: Vasil'yev, S. S., Komarov, V. V., Popova, A. M.

TITLE: Powder Loaded Nuclear Photoemulsions (Yadernyye fotoemul'sii s poroshkovymi napolnitelyami)

PERIODICAL: Priory i tekhnika eksperimenta, 1959, Nr 1, pp 48-50 (USSR)

ABSTRACT: A description is given of a method of introducing powders into nuclear emulsions. The powders must be insoluble and must be prepared from chemically pure elements or compounds. The size of the powder particles has a lower limit equal to the size of the grains of the background. Powders have been used consisting of particles whose diameter was 1-2  $\mu$ . The powders were deposited on the surface of a nuclear emulsion which was then covered by another emulsion. The deposition of the powder was carried out in a "powder chamber" which was found to be better than the deposition by electrical means or by sedimentation from a suspension. The amount of powder-dust deposited was determined by counting the number of particles per unit area under a microscope. The accuracy

Card 1/2

SOV/120-59-1-10/50

Powder Loaded Nuclear Photoemulsions

of this method is 15%. The amount of material introduced into the emulsion in this way was between  $10^{19}$  and  $10^{20}$  nuclei per  $\text{cm}^2$  of the emulsion. There are no figures, 7 references, of which 4 are Soviet and 3 French.

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki MGU  
(Scientific Research Institute for Nuclear Physics of the  
Moscow State University)

SUBMITTED: January 6, 1958.

Card 2/2

AUTHORS: Vasil'yev, S. S., Komarov, V. V., 20-119-5-20/59  
Popova, A. M.

TITLE: Investigation of  $(n, \alpha)$  and  $(n, t)$  Reactions on  $\text{Be}^9$   
(Issledovaniye reaktsiy  $(n, \alpha)$  i  $(n, t)$  na  $\text{Be}^9$ )

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 5,  
pp. 914-917 (USSR)

ABSTRACT: The reactions  $\text{Be}^9(n, \alpha)\text{He}^6$  and  $\text{Be}^9(n, t)\text{Li}^7$  taking place under participation of fast neutrons with energies of from 1 to 19 MeV were observed in specially produced layered nuclear-photoemulsions with a filler of fine powder of spectrally pure beryllium. A lithium target irradiated with 4 MeV-deuterons served as neutron source. The photo-plates were inclined by  $6^\circ$  to the direction of the neutron beam. The irradiated and developed photoplates were checked under the microscope in order to discover two-membered stars with their center in a particle of the beryllium filler. Such stars can form by the reactions  $(n, \alpha)$ ,  $(n, t)$  and  $(n, 2n)$  on  $\text{Be}^9$  nuclei. The separation of the traces corresponding to these reactions is shortly

Card 1/4

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discussed. Special attention was paid to the stars of the reaction  $(n, t)$  as there are no data whatever on this reaction in publications. After measuring the selected reactions  $\text{Be}^9(n, \alpha)\text{He}^6$  and  $\text{Be}^9(n, t)\text{Li}^7$  the calculations were carried out on the basis of the conservation theorems of energy and momentum, in order to determine the energy of the primary neutron causing this star. Besides, it was to be checked if the investigated case is correctly described by the corresponding reaction. The formula for the computation of the Energy  $E_n$  of the primary neutron in the reaction  $\text{Be}^9(n, \alpha)\text{He}^6$  is put down. For the same reaction also the dependence of its cross section on the energy of the impinging neutrons is mentioned. The values obtained in this coincide well with the results by P. H. Stelsens and E. C. Campbell (reference 5). This cross section has a well marked maximum within the range of energies  $E_n$  from 2 to 4 MeV. The reaction  $(n, \alpha)$  may pass the compound nucleus  $\text{Be}^{10}$  which in this range of energy has a group of closely situated levels: 9,27 and 9,4 MeV. A further

Card 2/4

Investigation of  $(n, \alpha)$  and  $(n, t)$  Reactions on  $\text{Be}^9$  20-119-5-20/59

diagram shows the angular distribution of the  $\alpha$ -particles in the system of gravity for  $E_n = 2$  to  $E_n = 5$  MeV. The angular distribution does not depend on the energy of the impinging neutrons and is symmetrical in relation to  $90^\circ$ . Also this proves the above mentioned assumption concerning the passage of a compound nucleus. The mechanism of "capturing" in the reaction  $(n, t)$  on  $\text{Be}^9$  can be explained only hardly by a model according to which the nucleus  $\text{Be}^9$  can be represented as a system  $(n, \text{Be}^8)$  or  $(n, \alpha, \alpha)$  with an odd neutron in the P-state in the external part of the nucleus. Probably in the external part of the nucleus  $\text{Be}^9$  a quasideuteron can temporarily exist. There are 3 figures and 12 references, 5 of which are Soviet.

ASSOCIATION:  
Card 3/4

Nauchno-issledovatel'skiy institut yadernoy fiziki  
Moskovskogo gosudarstvennogo universiteta im. M. V.

24(5)

AUTHORS:

Komarov, V. V., Neudachin, V. G.,  
Popova, A. M., Teplov, I. B.

SOV/56-35-4-22/52

TITLE:

On the Stripping Mechanism in Reactions With Capture  
of Two Nucleons (O mekhanizme sryva v reaktsiyakh s  
zakhvatom dvukh nuklonov)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 4, pp 974 - 977 (USSR)

ABSTRACT:

The characteristic feature of angular distribution in  
the stripping reactions (d,p) and (d,n) and in the  
pickup reactions (p,d) and (n,d) is a maximum within  
the range of small angles. According to experiments,  
the pickup process may occur also in the reactions  
(n,t), (d,t), (d, $\alpha$ ), and others. The authors of this  
paper carried out a qualitative investigation of  
reactions of the type (n,t), (p,t), (n,He<sup>3</sup>) and (p,He<sup>3</sup>)  
(the reaction (p,t) on Li<sup>7</sup> was investigated by A.I.  
Baz, and A.A.Ogloblin delivered a lecture on this  
subject at the Moscow Conference on Nuclear Reactions,

Card 1/03



On the Stripping Mechanism in Reactions With Capture  
of Two Nucleons

SOV/56-35-4-22/52

1957). Investigation of reactions of the general type  $(n,t)$  is carried out by two processes: a) The process of "successive stripping"  $(n-d-t)$  with the formation of deuterium in the intermediate stage, and b) Direct transition  $(n-t)$ , the simultaneous capture of two nucleons. The authors investigate the angular distribution of the particles resulting from a) and b), taking account of the shell structure of the nucleus, and derive (in Born's approximation) an expression for the differential cross section, which has the following form:

$$\frac{d\sigma}{d\Omega} = \frac{M_n M_t}{4\pi^2 \hbar^4} \frac{k_t}{k_n} \frac{1}{(2S_n+1)(2J_1+1)} I^2.$$

Figure 1 shows the course of the curve for the angular distribution of a process of the type a) of the reaction  $Li^7(p,t)Li^5$ ,  $E_p=12$  MeV and  $l=1$ . For process a) as well as for process b) the development of angular distribution is very similar to the

Card 2/03

. On the Stripping Mechanism in Reactions With Capture  
of Two Nucleons

SOV/56-35-4-22/52

somewhat blurred curves characterizing the ordinary stripping process. The difference between a) and b) consists in the fact that in a) the part played in the ordinary stripping theory by the value of the orbital momentum is played here by  $l$  and in b) by  $L$ . Figure 2 shows the development of the angular distribution of a process b),  $Li^7(p,t)Li^5$  for  $E_p = 12$  and  $35$  MeV,  $L=0$  and figure 3 shows the same for  $L=2$ . In conclusion, the authors thank S.S. Vasil'yev for discussing the paper, and A.S. Davydov for discussing the questions raised. There are 3 figures and 15 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

Card 3/03

83596

S/056/60/038/005/029/050  
B006/B070

24.6600

AUTHORS:

Komarov, V. V., Popova, A. M.

TITLE:

Investigation of the Spectra of Neutrons Resulting From  
the Proton-induced Deuteron Decay Reaction <sup>19</sup>

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 38, No. 5, pp. 1559 - 1563

TEXT: The authors calculate the energy distribution of the neutrons from the  $p + d \rightarrow p + p' + n$  reaction for a total reaction energy of  $\sim 4$  Mev, the directions of emission of the neutrons in the center-of-mass system forming angles between 0 and  $180^\circ$  with the direction of the incident protons. It is assumed in the calculation that at any time two of the three nucleons formed in the reaction are interacting with each other. The three-body problem can then be reduced to a two-body problem, that of a virtual biproton and a virtual deuteron symbolizing the pair of nucleons interacting with each other in the final state. The nucleon interaction is taken into account without approximation, the corresponding parameters being taken from nucleon-nucleon scattering experiments. X

Card 1/4

Investigation of the Spectra of Neutrons  
Resulting From the Proton-induced  
Deuteron Decay Reaction

83596

S/056/60/038/005/029/050  
B006/B070

The interaction of the third nucleon with the virtual particle is considered in Born's approximation. The application of Born's approximation appears somewhat problematic. However, it has been utilized with success for studies of angular and energy distributions in stripping processes which are very similar to the problem investigated here. Thus, it may be assumed that in the case of interaction of a particle pair with a third particle, Born's approximation should lead to approximately correct results when the relative momenta of the particle pair are small. The orbital momentum of the p-d relative motion is assumed to be zero for the reaction studied here. The orbital momentum of the relative motion of the nucleons which arise in the reaction and unite to form a virtual biproton and a deuteron is also assumed to be zero. Then, according to the law of conservation of the total momentum of the system and the Pauli principle, the total momentum of the system is  $j = 1/2$  or  $3/2$ , and the spin of the virtual particles is  $s=0$  or  $1$ . An expression for the differential reaction cross section is given as a function of the reduced mass of the particles, the neutron energy state density, and the transition matrix elements. The determination of the matrix

Card 2/4

83596

Investigation of the Spectra of Neutrons  
Resulting From the Proton-induced  
Deuteron Decay Reaction

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B006/B070

elements leads to six integrals - two corresponding to the formation of the virtual biproton ( $I_{pp}$ ), and four corresponding to the formation of the virtual deuteron ( $I_{pn}$ ). Equations (3) and (4) give approximate expressions for  $I_{pp}$  and  $I_{pn}$ . The radial parts of the wave functions for  $q > q_0$  and  $q < q_0$  are also given ( $q_0 = 2.65 \cdot 10^{-13}$  cm). As Figs. 1 and 2 show, the numerical computations agree excellently with the experimental neutron spectra. Fig. 1 shows the spectrum of neutrons emitted at an angle zero with respect to the initial beam direction, with the incident beam of protons having an energy  $E_p$  of  $\sim 8.9$  Mev. Fig. 2 shows the same for  $E_p = 18.6$  Mev. The experimental value of the ratio of the differential cross sections is  $\frac{d\sigma}{d\Omega}(180^\circ) / \frac{d\sigma}{d\Omega}(0^\circ) = 1.8 \pm 0.3$ , and the theoretical value is 1.75. The applicability of this method of calculating the energy distributions of the reaction products for the clarification of the role of interactions of the particles in the final state is discussed. S. S. Vasil'yev, A. S. Davydov, Yu. M. Shirokov, N. A. Vlasov,

Card 3/4

83596

Investigation of the Spectra of Neutrons  
Resulting From the Proton-induced  
Deuteron Decay Reaction

S/056/60/038/005/029/050  
B006/B070

and B. V. Rybakov are thanked for interest and discussions. There are  
2 figures and 7 references: 5 Soviet and 2 US.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo  
universiteta (Institute of Nuclear Physics of Moscow  
State University) X

SUBMITTED: December 8, 1959

Card 4/4


29161 R  
S/048/60/024/009/012/015  
B117/B205

24.6600

AUTHORS: Komarov V. V. and Popova, A. M.

TITLE: Study of the energy distributions of products of nuclear reactions with emission of several particles

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 24, no. 9, 1960, 1153 - 1156

TEXT: The authors propose a method for investigating the energy distribution of products of nuclear reactions in which several particles of medium energy are emitted. The method takes account of the interaction of particles with a small relative momentum. The parameters of interaction are taken from experimental data on the dispersion of the particles considered. The interaction of a pair of particles having a small relative momentum with the other particles is studied in Born approximation. The application of Born approximation, is, strictly speaking, not justified at such energies. Nonetheless, this procedure has been adopted successfully to explain angular and energy distributions in stripping reactions within the range of energies concerned (Ref. 4: A. G. Sitenko, Uspekhi fiz. 

Card 1/5

Study of the energy...

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nauk vyp. 3, 577 (1958)), which are similar to the process studied. If three particles are emitted and all particle pairs are able to interact in the final state, then the wave function  $\Psi(t)$  must obey the Schroedinger equation for the problem in question. Interaction of the particles is obviously negligible if their relative momentum is much higher than the relative momentum of two particles corresponding to the energy of interaction of these particles. Taking account of the interaction of every pair of particles in the final state, the matrix element of the transition will assume the following form in Born approximation:

$$H \approx \langle \Psi_{123}^A [ (1 - \alpha_{12}) V_{12} + (1 - \alpha_{23}) V_{23} + (1 - \alpha_{31}) V_{31} ] \phi_{123} \rangle$$
  
 $\Psi_{123}$  and  $\phi_{123}$  are wave functions of the final and the ground state;  $\Psi_{123}$  is determined for every energy range of the particle under consideration, according to the value of the relative momentum of the particles. The new method was used to study the energy distributions of  $He^3$  nuclei from the reaction  $d + T \rightarrow He^3 + n + n$  in the center-of-mass system, for angles of  $25^\circ$  and  $75^\circ$  and at energies of  $\sim 12$  Mev of the incoming deuterons. The potential scat-

Card 2/5



Study of the energy...

29161 R  
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B117/B205

tering of two neutrons in the singlet state has been taken into consideration (Ref. 5: V. V. Komarov and A. M. Popova, Zh. eksperim. i teor. fiz. 38, 253 (1960)). The constant of neutron-neutron interaction was assumed to be 70 kev. In this case, the constant could not be obtained from a comparison of the experimental data (Ref. 6: J. E. Brolley, W. S. Hall, Jr., L. Rosen, H. Stewart, Phys. Rev., 109, 1277 (1958)) with the calculated curve, since the experimental data were not exact. The method described was also used to calculate the energy distributions of neutrons from the reaction  $p + d \rightarrow p + p + n$  in the center-of-mass system, between  $0$  and  $180^\circ$  and a total reaction energy of  $\sim 4$  Mev. Pertinent experimental data have been presented in Ref. 7 (A. N. Vlasov, S. P. Kalinin, B. V. Rybakov, V. A. Sidorov, Zh. eksperim. i teor. fiz. 38, vyp. 6, 1773 (1960)). The potential scattering of every pair of nucleons produced in the reaction was taken into account. It was found that both the calculated and the experimental spectrum for neutrons emitted at an angle of  $0^\circ$  show two maxima. The position and shape of the maxima at a neutron energy of  $\sim 0.7$  Mev are determined by the interaction of the neutron with the proton. The maximum at the upper boundary is due to the interaction of two protons with a small relative momentum. The cross section of the

Card 3/5

29161 R

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B117/B205

Study of the energy...

reaction  $p + d$  around the maximum at  $E_n$  of  $\sim 0.7$  Mev is larger than that around the maximum at the upper boundary of the neutron spectrum. Calculation showed that the form of the spectrum of neutrons emitted at an angle of  $180^\circ$  relative to the direction of the incoming protons is essentially determined by the interaction of protons with a small relative momentum. The ratio between the areas beneath the experimental points  $\frac{d\sigma}{d\Omega}(180^\circ) / \frac{d\sigma}{d\Omega}(0^\circ) = 1.8 \pm 0.3$  and beneath the corresponding theoretical points  $\frac{d\sigma}{d\Omega}(180^\circ) / \frac{d\sigma}{d\Omega}(0^\circ) = 1.75$  proves that the angular distributions of reaction products can be described by the new method if several particles are emitted. The "isotopic invariance" suggests that the spectrum of protons emitted at an angle of  $0^\circ$  by the reaction  $n + d \rightarrow n + n + p$  at energies of  $\sim 10$  Mev of the incoming neutrons has also two maxima, just as the corresponding spectrum of neutrons from the reaction  $p + d \rightarrow p + p + n$ . The first maximum appearing at a proton energy of  $\sim 0.7$  Mev must correspond to the interaction of neutron and proton with a small relative momentum, and the second maximum at the upper boundary of the spectrum is ascribed to the interaction between two neutrons with a small relative momentum.

Card 4/5

KOMAROV, V.V.; POPOVA, A.M.

Energy distribution in reaction products with emission of several particles, Zhur. eksp. i teor. fiz. 38 no.1:253-255 Jan '60.

(MIRA 14:9)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

(Nuclear reactions)

83677

S/048/60/024/009/011/015  
B063/B063

24.6810

AUTHORS:

Vasil'yev, S. S., Komarov, V. V., Popova, A. M.

TITLE:

Energy States of the  $\text{Be}^8$  Nucleus in the Decay Reaction of the  $\text{C}^{12}$  Nucleus in Three Alpha Particles Under the Action of Protons and Neutrons <sup>19</sup>

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 9, pp. 1149-1152

TEXT: The disintegration of  $\text{C}^{12} \rightarrow 3\alpha$  under the action of neutrons having energies between 8.5 and 19 Mev and of protons having energies between 15 and 30 Mev was studied in Ref. 1 and Ref. 2, respectively. The disintegration of  $\text{C}^{12}(n, n'3\alpha)$  and  $\text{C}^{12}(p, p'3\alpha)$  in photoemulsions bombarded with neutrons and protons of different energies was observed in the form of three- and five-pronged stars, respectively. The 72-cm cyclotron of NIIYaF MGU and the 120-cm proton synchrotron of NIIYaF MGU were used for this purpose. The analysis of the stars yielded data on the energies and the spatial distribution of the particles participating in the dis-

Card 1/3

83677

Energy States of the  $\text{Be}^8$  Nucleus in the Decay

S/048/60/024/009/011/015

Reaction of the  $\text{C}^{12}$  Nucleus in Three Alpha

H003/B063

Particles Under the Action of Protons and Neutrons

integration and on the excitation energies of compound nuclei ( $\text{Be}^8$ ). The analysis was made by well-known methods. The bombardment technique is described in Ref. 5. Fig. 1a shows the energy distribution of alpha particles from the  $\text{C}^{12}(\text{n}, \text{n}' 3\alpha)$  decay in the center-of-mass system of the  $\text{C}^{13}$  nucleus for a group of energies of the incoming neutrons. Fig. 1b shows the energy distribution of the alpha particles from the  $\text{C}^{12}(\text{p}, \text{p}' 3\alpha)$  decay in the center-of-mass system of the  $\text{N}^{13}$  nucleus for four groups of energies of the incoming protons. Fig. 2a and b show excitation energies of  $\text{Be}^8$ , which were calculated for every single pair of particles in the stars observed. The experimental histogram (Fig. 2a) as a whole agrees with previous papers (Ref. 7). The data obtained (Fig. 1) indicate the possibility of a simultaneous decay reaction of  $\text{C}^{12}$  to form three alpha particles and of a strong resonance interaction of the particles in the final state. In this case, the lifetime of the  $\text{Be}^8$  nucleus is about the nuclear life-time.

Card 2/3

Card 3/3

S/048/60/024/009/010/015  
B063/B063AUTHORS: Komarov, V. V., Kurepin, A. B., Popova, A. M.TITLE: Application of the (n,2n) Reaction<sup>19</sup> in Nuclear Spectroscopy <sup>19</sup>PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,  
Vol. 24, No. 9, pp. 1145-1148

TEXT: In the present article, the (n,2n) reaction is regarded as a pick-up reaction. Its application instead of the (p, d) and (n, d) reactions gives rise to the hope that data on the energy levels of nuclei can be obtained from the angular distribution curves in the ranges of medium-weight and heavy nuclei, and low energies. In these ranges, Coulomb effects play a large role and make it impossible to determine the characteristics of the energy levels with the aid of the usual pickup reactions, as was pointed out by V. G. Neudachin. A method of calculation is suggested. Its applicability is illustrated by calculating the angular distributions for the centers of mass of the two emitted neutrons from the

$\text{Be}^9(n, 2n) \text{Be}^8$  reaction (Fig. 1). Bombardment of  $\text{Be}^9$  with 14-Mev neutrons leads to the excitation of the 2.9-Mev level of  $\text{Be}^8$  in this reaction.

Card 1/2

Application of the (n,2n) Reaction in  
Nuclear Spectroscopy

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B001/B061

The pickup instant may be determined from a comparison of the experimental and calculated angular distributions (Curve a and Curve b, respectively). The calculated curve is shown in Fig. 2. Experimental measurements are uncomplicated as the distribution reaches its maximum at a sufficiently large angle. No special investigations were made to show the particular features of the angular distribution of neutrons from the (n,2n) reaction. There are 2 figures and 6 references; 5 Soviet. ✓

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gos. universiteta im. M. V. Lomonosova  
(Scientific Research Institute of Nuclear Physics of  
Moscow State University imeni M. V. Lomonosov)

Card 2/2

05689

S/056/60/038/006/032/049/XX  
B006/B070

246510

AUTHORS:

Komarov, V. V., Kurepin, A. B., Popova, A. M.

TITLE:

The Possibility of Using the Reaction  $(n,2n)$  in Nuclear Spectroscopy

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960.  
Vol. 38, No. 6, pp. 1824-1828

TEXT: Butler has already shown that stripping and pickup reactions can be used to obtain data on nuclear energy levels. In view of this, the reaction  $(n,2n)$  is now studied in the present paper; the reaction is considered a stripping reaction. In previous papers it has been shown that narrow peaks appear in the energy distributions of reaction products if several particles are emitted including two neutrons, because of the interaction of the two neutrons in the final singlet state. If the strong interaction of the neutrons with small relative energies is considered, a stripping reaction can be assumed, that is, a simultaneous emission of two neutrons in about the same direction caused by the interaction of the incident

Card 1/4



85689

The Possibility of Using the Reaction  
(n,2n) in Nuclear Spectroscopy

S/056/60/038/006/032/049/XX  
B006/B070

neutron with the nucleus. Peaks can appear in the total momentum distribution of the two emitted neutrons, corresponding to the energy levels of the nucleus  $A-1$  in the reaction  $A(n,2n)A-1$ . It is shown by specific examples that the dependence of the areas of the peaks on the direction of motion of the center of mass of the two neutrons has the same character as in stripping and pickup reactions. It can be shown that if instead of (n,d) or (p,d) reactions (n,2n) reaction be used, the form of the angular distribution curves will give information on the characteristics of the energy levels of medium and heavy nuclei, since for such nuclei the Coulomb effects in ordinary pickup reactions have a great significance. This fact was brought to the notice of the present authors by V. G. Neudachin. The angular distribution of the center of mass of the two neutrons emitted simultaneously is calculated by taking into account their interaction in the final state. The results are discussed with the help of two examples. The angular distribution of the center of mass of the two neutrons emitted in the reaction  $Be^9(n,2n)Be^8$  is calculated for the case when the incident neutron has an energy of 14 Mev. In this reaction, the final nucleus is in an excited state of 2.9 Mev. The results

Card 2/4

85689

The Possibility of Using the Reaction  
(n,2n) in Nuclear Spectroscopy

S/056/60/038/006/032/049/XX  
B006/B070

are shown in the two diagrams of Fig. 1. The second example taken is of the reaction  $Pb^{208}(n,2n)Pb^{207}$ , where the  $Pb^{207}$  nucleus is in an excited state of 1.63 Mev. Fig. 2 shows the angular distribution for  $l=6$ . The possibility of an experimental verification, and the difficulties involved in it are discussed. S. S. Vasil'yev is thanked for discussions. There are 2 figures and 11 references: 6 Soviet, 3 US, 1 British, and 1 Dutch.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: January 11, 1960

Card 3/4

27477

S/048/61/025/009/002/007

B104/B102

24.6400

AUTHORS: Vasil'yev, S. S., Komarov, V. V., and Popova, A. M.

TITLE: Properties of the lower states of the  $\text{Li}^5$  and  $\text{Be}^8$  nuclei produced in decays of light nuclei

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 9, 1961, 1117 - 1120

TEXT: This paper was read at the 9th Annual Conference on Nuclear Spectroscopy. It deals with the question how the influence of interaction of reaction products in the final state can be taken into account when studying the integral energy distribution of particles produced by direct decay of a compound nucleus. The differential cross section of the decay of a compound nucleus with spin  $I$  and parity  $\pi$  into  $n$  particles with the energies  $E_i$  and the momenta  $\vec{p}_i$  can be written as

$$d\sigma \sim \delta\left(\sum_{i=1}^n (E_i - E)\right) \delta\left(\sum_{i=1}^n \vec{p}_i\right) \prod_{i=1}^n d^3p_i |H_{ab}|^2,$$

Card 1/6

27477

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B104/B102

Properties of the lower states of ...

where  $E$  is the total energy of the system, and  $H_{ab}$  is the matrix element of the transition from the initial state  $a$  into the final state  $b$ . This element has the form

$\langle \prod_{i=1}^n \psi_i \chi(S_i) | V | \psi_{jjz} \rangle$ ,  $\psi_{jjz}$  being the wave function of the compound nucleus and  $\psi_i \chi(S_i)$  the wave and spin function of the  $i$ -th particle.

If the particles do not interact in the final state, the  $\psi_i$  represent plane waves. In this case, the motion of two particles,  $i$  and  $j$ , can be represented as the product of two plane waves:  $\exp(-i \vec{q} \cdot \vec{r}/\hbar) \exp(-i \vec{p} \cdot \vec{R}/\hbar)$ , where  $\vec{q} = \frac{1}{2} (\vec{p}_i - \vec{p}_j)$  is the momentum of the relative particle motion. The wave function of the relative motion of the interacting particles  $i$  and  $j$  is a distorted wave. The radial part of the wave function of the relative motion of the scattered particles is approximately given by  $\varphi(\rho) = f(E_{rel})g(\rho)$ , as was shown by E. W. Hamburger (Thesis, University of Pittsburgh, 1959). Using this expression, the differential reaction

Card 2/6

27477

S/048/61/025/009/002/007

B104/B102

Properties of the lower states of ...

cross section is written as

$\frac{d\sigma}{dE_1} \sim f(E_1) \frac{\sin^2(\delta + \Phi)}{q^2}$ . If a simultaneous interaction between two pairs

of particles in the final state is possible, the differential cross section acquires the form

$$\frac{d\sigma}{dE_1} \sim f(E_1) \frac{\sin^2(\delta_1 + \Phi_1)}{q_1^2} \cdot \frac{\sin^2(\delta_1 + \Phi_2)}{q_2^2} \quad (6).$$

This is illustrated by a study of the energy distribution of protons from

the decay of  $C^{12}$  into three alphas induced by 15 - 30 Mev protons. A previous paper by the authors (S. S. Vasil'yev et al., Izv. AN SSSR, Ser. fiz., 24, 1145 (1960)) has shown that four- and three-particle decays of

$C^{12}$  may be accompanied by interactions of two alphas at the levels 0, 2.9, and 11.8 Mev of the  $Be^8$  nucleus, and by an  $\alpha$ -p interaction at the ground level of the  $Li^5$  nucleus. This indicates that  $Li^5$  and  $Be^8$  occur, not as

Card 3/6

X

27477  
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B104/B102

Properties of the lower states of ...

compound nuclei of a cascade, but as a result of interaction of the decay products. The excitation energies of the  $\text{Be}^8$  and  $\text{Li}^5$  nuclei should then appear in the histograms, and the alpha and proton spectra should be described by statistical distributions calculated on the assumption of a four-particle decay with the above-mentioned interactions. To prove this assumption, the authors investigated the energy distribution of protons from the  $\text{C}^{12}(\text{p}, \text{p}')^3\alpha$  reaction at energies of 15 - 30 Mev of the primary protons. (6) is represented in a form corresponding to this case. The resulting curve for the proton energy distribution agrees well with the experimental results. There are 1 figure and 7 references: 5 Soviet and 2 non-Soviet. The references to English-language publications read as follows: Hamburger E. W., Thesis, University of Pittsburgh, 1959; Brueckner K., Phys. Rev., 82, 598 (1951).

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gos. universiteta im. M. V. Lomonosova (Institute of Nuclear Physics of Moscow State University imeni M. V. Lomonosov)

Card 4/6

24-6500

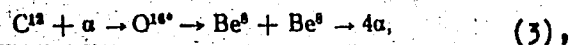
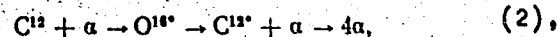
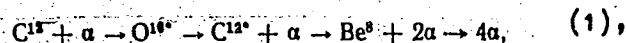
31771  
S/056/61/041/006/011/054  
B113/B104

AUTHORS: Vasil'yev, S. S., Komarov, V. V., Popova, A. M.

TITLE: Investigation of the reaction  $C^{12}(\alpha, 4\alpha)$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6(12), 1961, 1757-1760

TEXT: The authors studied the decay of the  $C^{12}$  nucleus into 3  $\alpha$ -particles induced by a 23-Mev  $\alpha$ -particle. The  $\alpha$ -particles were accelerated on the 120-cm cyclotron of the NIIYaF MGU, the reactions took place in НИКФИ (NIKFI)-type nuclear emulsion plates of 50-400  $\mu$  thickness: Я 2 (Ya2), T-1 (T-1), T-2 (T-2), T-3 (T-3), and D (D). The following mechanisms are possible:

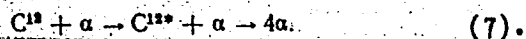
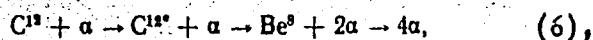
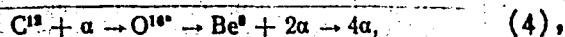


Card 1/3

31771

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B113/B104

Investigation of the reaction ...



To determine the probability of these reaction modes, the authors studied the excitation energy of the  $C^{12}$  and  $Be^8$  compound nuclei, the angular and energy distribution of the  $\alpha$ -particles. The weight of the true values  $E_{exc}(C^{12})$  must amount to  $1/4$  if the reaction proceeds according to mechanisms (1) or (2). The distribution of the calculated values  $E_{exc}(C^{12})$  was also measured. Mechanisms (1) and (2) proved to be very unlikely. The probability of the modes (3), (4), (5) in the decay of the  $C^{12}$  nucleus is determined from the energy distribution of the resulting  $\alpha$ -particles. If the reaction proceeds through a straight decay of the  $O^{16*}$  compound nucleus into four independent particles, the energy distribution of the resulting  $\alpha$ -particles must satisfy the formula:

Card 2/3



31771  
S/056/61/041/006/011/054  
B113/B104

Investigation of the reaction ...

$F(E_\alpha) = E_\alpha^{1/2} \cdot (E_{\max} - \mu \cdot E_\alpha)^{1/2}$ . A comparison of the curve obtained from this formula with the curve for the case where the compound nucleus  $O^{16*}$  decays into two  $Be^8$  nuclei, and the latter into two  $\alpha$ -particles each, showed that mode (3) was unlikely. Most probable is the formation of an  $O^{16*}$  compound nucleus decaying into four  $\alpha$ -particles with resonance interaction between the  $\alpha$ -particles in the ground state. There are 2 figures and 5 Soviet references.

SUBMITTED: June 27, 1961

X

Card 3/3

S/120/61/000/001/003/062  
EO32/E114

**AUTHORS:** Vasil'yev, S.S., Komarov, V.V., Koshelyayev, G.V.,  
and Popova, A.M.

**TITLE:** Production of Proton Beams of Various Energies Inside  
the Synchrocyclotron Chamber at Intermediate Energies

**PERIODICAL:** Pribery i tekhnika eksperimenta, 1961, No.1, pp.17-18

**TEXT:** In nuclear reaction studies employing protons of intermediate energies inside the synchrocyclotron chamber, it is convenient to use a method in which a number of targets are simultaneously irradiated by proton beams of approximately equal intensity but different energy (with sufficiently small energy spread in each beam). For this purpose the main proton beam is directed on to an internal target in the form of a wedge. In the latter the original protons are slowed down and scattered in different ways so that the protons leaving the wedge have an energy spectrum. In the magnetic field protons of different energies move over trajectories of different radii. These trajectories are intercepted by a set of slits which thus define a number of proton beams of different energies. The slits are located on the bottom  
Card 1/4

S/120/61/000/001/003/062  
E032/E114

Production of Proton Beams of Various Energies Inside the  
Synchrocyclotron Chamber at Intermediate Energies

of the chamber and are arranged in such a way that they let through only those protons which are scattered at small angles in the downward direction but are practically unscattered in the horizontal plane. This method has been used in nuclear reaction studies using the 120 cm synchrocyclotron of the Scientific Research Institute of Nuclear Physics of the Moscow State University (Nauchno-issledovatel'skiy institut yadernoy fiziki MGU) (initial proton energy 30 MeV). The wedge was made of copper and had an angle of  $40^\circ$ . The intercepting slits were 3 mm wide each and defined 9 proton beams in the energy range 7.5-30 MeV. The energy spread in each channel was smaller for the smaller energies. The nine beams were allowed to strike nuclear emulsions at an angle of  $6^\circ$ . In order to obtain approximately equal intensities in the 9 channels the working part of the wedge was made approximately equal to the radial half-width of the synchrocyclotron beam.

There is 1 figure.  
Card 2/ 4

S/056/62/043/003/001/063  
B125/B102

AUTHORS: Vasil'yev, S. S., Komarov, V. V., Popova, A. M.

TITLE: Study of decay reactions of carbon and oxygen nuclei under the action of 15-29-Mev protons

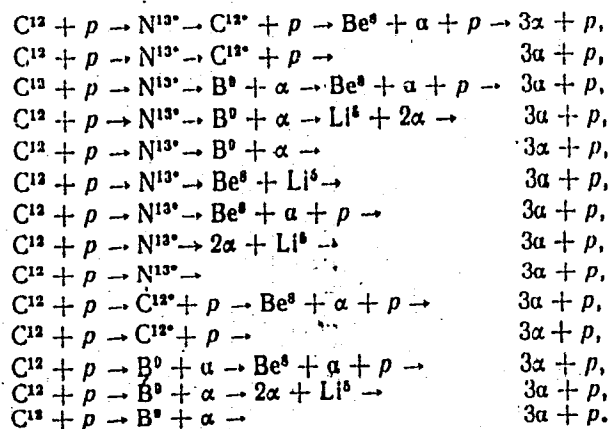
PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 3(9), 1962, 737-748

TEXT: The energy distribution of the products of the reactions  $C^{12}(p, p'3\alpha)$  and  $O^{16}(p, p'4\alpha)$  was determined from 5 and 6-pronged stars in photographic plates. These plates were irradiated in the 120-cm synchrocyclotron of the Institut yadernoy fiziki MGU (Institute of Nuclear Physics of MGU). For  $C^{12}(p, p'3\alpha)$  reactions and with  $15 \text{ Mev} \leq E_p \leq 29 \text{ Mev}$  the following reaction mechanisms are possible:

Card 1/4

Study of decay reactions of ...

S/056/62/043/003/001/063  
B125/B102



(1)-(14)

Card 2/4

Resonance interaction in the ground states of the nuclei  $\text{Li}^6$  (ground-state) and  $\text{Be}^8$  (ground-state, 30-40% probability; excited states  $2.9 \pm 1.5$  Mev, 50%;  $11.3 \pm 0.3$  Mev, 10-20% probability). There are 8 figures and 2 tables.

Card 3/4

Study of decay reactions of ...

S/056/62/043/003/001/063  
B125/B102

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo  
universiteta (Institute of Nuclear Physics of the Moscow  
State University)

SUBMITTED: December 20, 1961

Card 4/4

ACCESSION NR: AP3009486

S/0188/63/000/005/0018/0023

AUTHOR: Komarov, V. V.; Popova, A. M.

TITLE: A diagrammatic method for determining the nucleon-nucleon scattering amplitude

SOURCE: Moscow. Universitet. Vestnik. Seriya 3. Fizika, astronomiya, no. 5, 1963, 18-23

TOPIC TAGS: nucleon, nucleon-nucleon scattering, scattering amplitude, nucleon scattering amplitude, perturbation theory, Bethe-Peierls equation

ABSTRACT: Equations for the nucleon-nucleon scattering amplitude have been set up by summing the infinite series of perturbation theory diagrams. For simplicity, the case of two spinless particles in the proximity of the zero-range of nuclear forces is considered. Various types of diagrams are given for the transformation of two nucleons into two nucleons, describing the creation and annihilation of deuterons. Proceeding from the expression for the S-matrix and substituting nucleon creation and annihilation operators and suitable deuteron creation and annihilation operators, the values of the contributions of these diagrams which describe the interaction are determined. These values were previously used by the authors to determine the scattering amplitude of three or more nucleons

Card 1/2

KOMAROV, V. V.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Physics Institute imeni P. N. Lebedev in 1962:

"Investigation of Several Breakdown Reactions of Light Nuclei at Moderate Energies."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145



L 16888-63

EWI(m)/HDS AFFTC/ASD

ACCESSION NR: AP3005271

S/0056/63/045/002/0211/0227

55  
52

AUTHOR: Komarov, V. V.; Popova, A.M.

TITLE: Investigation of nucleon-induced deuteron disintegration by the diagram, summation method 19

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 214-227

TOPIC TAGS: deuteron disintegration, three nucleon interactions, interaction amplitude, diagram technique, pole diagram, triangular diagram

ABSTRACT: A diagram summation technique is used to derive integral equations for the three-nucleon interaction amplitudes, such as the amplitude of deuteron disintegration induced by nucleons. In order to see which types of processes are taken into account in the various approximation, the first diagrams of corresponding to the first iterations of the equations are considered and their contribution calculated in analytic form. An exact correspondence is established between the contributions of the first diagrams and the results previously obtained by the authors in the first perturbation-theory approximation by taking into account final-state particle interactions, which correspond to contributions from pole and triangular

Card 1/2

Card 2/2

KOMAROV, V. V.; POPOVA, A. M.

"The Diagram Method of Investigation of the Few Nucleon Systems."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22  
Feb 64.

MGU (Moscow State Univ)

KOMAROV, V. V.; POPOVA, A. M.

"The Non-Relativistic Three-Body Problem."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi,  
14-22 Feb 64.

Moscow State Univ.

ACCESSION NR: AP4042576

S/0056/64/046/006/2112/2125

AUTHORS: Komarov, V. V.; Popova, A. M.

BR

TITLE: The four body problem at low energies

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 6, 1964, 2112-2125

TOPIC TAGS: perturbation theory, Feynman diagram, nonrelativistic particle, nucleon, particle interaction, particle scattering, scattering amplitude, n body problem

ABSTRACT: The analysis is based on the summation of an infinite series of nonrelativistic diagrams, such as is used for a description of the two-body and three-body problem by the authors previously (Vestnik MGU, ser. III, No. 5, 18, 1963; ZhETF, v. 45, 214, 1963; Nucl. Phys., in press; Vestnik MGU, No. 5, 1964). Integral equations are written for the amplitude of the reactions of interaction of four nucleons under the assumption that only two-body forces are signifi-

Card 1/3